



BRITISH COLUMBIA SAFETY AUTHORITY

STATE OF SAFETY REPORT 2007



DOC
BC
S1011
D:S727
2007
c.3



WHO WE ARE



The British Columbia Safety Authority is an independent, self-funded corporation that inspires safety excellence in British Columbia by partnering with business, industry and the general public to enhance the safety of technical systems, products, equipment and work.

We are responsible for overseeing the safety of the following industry sectors in the province:

- Amusement rides and recreational railways
- Boilers, pressure vessels and refrigeration systems
- Electrical equipment and systems
- Elevating devices such as elevators and escalators
- Gas appliances and systems
- Passenger ropeways such as aerial trams and ski lifts
- Railways



Our prime assets are our creative, knowledgeable, highly qualified, skilled and experienced employees, who have a collective passion for safety.

Our services include:

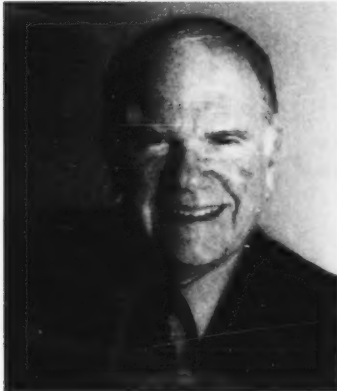
- Preventing accidents
- Educating the public about safety issues
- Issuing permits
- Inspecting technical work and equipment
- Certifying individuals and licensing contractors to meet regulatory requirements
- Reviewing regulations for each industry sector we oversee
- Investigating incidents
- Registering new equipment and designs
- Contributing to provincial and national code development



TABLE OF CONTENTS

Message from the Chair	2
Message from the President & Chief Executive Officer	3
About this Report	4
Improving Safety by Focusing on Accident Prevention	6
Our Industries	7
Incident Notification in 2007	8
Identifying Poor Performers	11
Amusement Rides and Recreational Railways	12
Boilers, Pressure Vessels and Refrigeration	15
Electrical	18
Elevating Devices	22
Gas	25
Passenger Ropeways	29
Railways	32
Appendix – Municipalities Administering the <i>Electrical Safety</i> or <i>Gas Safety Regulations</i>	35
Definitions	36

MESSAGES



MESSAGE FROM THE CHAIR

In this, our fourth State of Safety Report, we share information about the safety incidents that occurred in 2007 in each of the technology areas overseen by the BC Safety Authority.

This report is an essential element of our organization's commitment to openness and transparency. Sharing information about incidents enables us to work with our industry partners to identify safety trends and take action to minimize hazards. It also enables us to launch education campaigns in response to specific safety issues.

We are committed to sharing our safety data, but it is important to remember that a number of municipalities oversee electrical or gas safety services for their residents, and the incident data collected by these municipalities is not included here. We also rely on our industry partners to report incident data to us. We value the input provided by our clients and we encourage them to make incident reporting a priority. Accurate and timely data is absolutely crucial for us in identifying safety trends and preventing accidents.

Over the past year, the BC Safety Authority has been developing a new operational model that focuses on four key areas to prevent accidents: education, enforcement, research and inspection. Our Board is pleased with the progress that has been made to date and we are confident that this model will enable our organization to be more proactive in identifying and minimizing safety risks in the seven technology areas that we regulate.

On behalf of the Board, I would like to thank BC Safety Authority staff and our stakeholders for their dedication to making BC a leader in public safety. Our people are educating the public about safety risks, conducting inspections, analyzing safety trends, developing and implementing policies that minimize safety hazards, and consulting with our stakeholders to help them make decisions that will prevent accidents. Together, they are working to maintain and improve the safety of our province.

Sincerely,

A handwritten signature in black ink, appearing to read 'John F. Watson'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

JOHN F. WATSON, P.ENG
CHAIR OF THE BOARD



MESSAGE FROM THE PRESIDENT & CHIEF EXECUTIVE OFFICER

Each year, we report on the incidents that occurred in the seven technology areas we oversee – summarizing the total number of incidents reported to us during the year, providing an overview of our inspection activities and discussing the initiatives we've developed to improve safety.

The numbers tell us one part of the story. But they are not the whole story.

We are still developing the relationships and systems that will give us a broader and deeper understanding of the accidents that have occurred. It is very important to us that our industry partners increase their levels of incident reporting: this is what gives us the data we need to identify hazards, assess trends and develop the solutions that will prevent incidents from occurring in the future. To that end we are committed to strengthening our relationships with industry partners and working with them to improve public safety.

We are also investing in new reporting systems for collecting and analyzing incident data. We launched a new incident reporting system on January 1, 2007 that has made it much easier for our staff to collect information about incidents, share this information with their colleagues throughout the province and report on the results of investigations.

With this in mind, it is clear that the data included in this report, while useful, can be enhanced so that comparisons of the results from one year to the next will provide a much more accurate sense of the safety issues in the province.

There are other elements of this report that fill in our understanding of safety risks and trends. Our safety officers are out in the field every day and their consultations with clients, inspections and investigations into incidents give us invaluable information about safety risks. This report summarizes some of their findings and discusses our strategies for improving safety in each of our technology areas.

I am optimistic that we are developing the relationships and systems we need to maximize our efforts in data collection and analysis. It is this information that contributes to the research pillar of our new Accident Prevention Model, and is therefore of vital importance as we evolve into an organization that ultimately has all the tools it needs to reduce risk and prevent accidents.

Sincerely,

HARRY DIEMER

PRESIDENT & CHIEF EXECUTIVE OFFICER

ABOUT THIS REPORT

This report is the fourth annual publication on the state of safety for the technologies overseen by the BC Safety Authority. The *2007 State of Safety Report* provides a summary and overview of reported incidents as well as the outcomes of inspections carried out by our safety officers between January 1, 2007 and December 31, 2007.

The British Columbia Safety Authority is a not-for-profit organization incorporated through the *Safety Authority Act*. It is responsible for administering the *Safety Standards Act* and portions of the *Railway Safety Act*, and the power to do so is delegated by Administrative Agreements with the Province of British Columbia. We deliver safety services that apply to work and products related to amusement rides, boilers, pressure vessel and refrigeration systems, electrical systems and equipment, elevating devices and passenger conveyors, natural gas or propane systems and equipment, passenger ropeways and specific types of railways.

This report details the number, types and causes of incidents reported in each regulated industry. In addition, it summarizes inspection data and identifies the safety risks found by our technical staff. The analysis of this data is used to develop incident prevention strategies in specific industry sectors. It is intended that this information will provide other organizations, industry and the public with information about safety hazards and trends so that both industry and the BC Safety Authority can act together to prevent incidents before they occur.

DATA COLLECTION AND ANALYSIS – AN IMPROVEMENT OVER TIME

Information in this report is obtained from investigation records for incidents reported to the BC Safety Authority and inspection reports from our safety officers. Our incident reporting system and data collection process have been evolving since April 1, 2004, when the BC Safety Authority began operations. Revisions and changes to reporting methods have been ongoing as continual improvements were made to the process. Starting in 2006, we changed the reporting methods to provide much more accurate results. However, because of the different collection methodologies used, comparisons with the results from previous years are of limited value and we have therefore only compared the 2007 incident results with those of 2006.

Improvements to the reporting system over the past three years have necessitated changes to how and what information is recorded. These improvements have resulted in a much more extensive and accurate database. However, because of the differences in the records of the database, comparisons to previous years' data are limited and make it difficult to assess outcomes and identify trends.



A new computerized system for incident reporting was implemented on January 1, 2007. This new system has expedited the collection of incident data and has provided readily accessible information about the status and results of investigations. As a result, there has been a 60% improvement in the turnaround time from initial notification to the closing of the investigation file. The collection of all incident data in one common system has also improved our analysis capability.

Despite the improvements in the new reporting system, a number of limitations in the reporting process impact the effectiveness of the database and the subsequent analysis:

Many incidents are missed because they are not within the BC Safety Authority's jurisdiction and are not reported to us:

- Ten municipalities throughout British Columbia have agreements with the Province to administer portions of the *Safety Standards Act*; 8 municipalities administer the *Electrical Safety Regulation* and 7 municipalities administer the *Gas Safety Regulation*. This means that approximately 650,000 residential homes receive electrical safety services – and 560,000 homes receive gas safety services – from their municipality.
- In accordance with an agreement with the Province, incidents for common carrier railways are reported to and investigated by the Transportation Safety Board of Canada.

Reporting rates vary across industries and not all incidents that have occurred are reported to the BC Safety Authority. There may be many reasons for this including:

- People may be unaware of the importance of reporting an incident,
- They may consider damage that is readily repaired to be simply maintenance rather than an incident, or
- They may believe that there will be unfavourable consequences if they report an incident.

The available data set may be too small to produce statistically significant results.

Ongoing improvements to our reporting system, combined with the establishment of a research department, will enable us to generate much more detailed, insightful reports on safety trends and issues for the benefit of both clients and stakeholders. This information can be used by industry in day-to-day work to enhance safety, and these improved reports should

encourage more comprehensive incident reporting to build a detailed database for the benefit of clients and stakeholders.

As there are limitations on the incident reporting system and the subsequent analysis of its data, this report will describe the distribution and characteristics of the incidents that occurred in 2007, provide details on the injuries and deaths in the regulated technologies and outline the activities conducted to prevent additional incidents and mitigate the consequences of future incidents. In addition to highlighting safety risks, the report identifies areas where safety can be improved. The goal is to increase the level of safety in British Columbia by analyzing the available data and using the results of this scrutiny to develop measures that will improve public safety.

IMPROVING SAFETY

FOCUSING ON ACCIDENT PREVENTION

In 2006, the BC Safety Authority embarked on the Horizon Project – a review of “how” the BC Safety Authority administers safety in British Columbia. Working with risk experts Det Norske Veritas, we examined and compared our technical safety systems to current best practices worldwide.

In 2007, the project moved into its second phase to create a strategic operational model for the BC Safety Authority. Employees representing all facets of the Safety Authority’s operations – including employees from all technologies, geographical regions and work functions – worked together to develop this model. The group’s goal was to determine the needs of our clients, both internal and external to the organization, and to research business processes that would move our organization beyond an inspection agency towards a safety authority. The operational model adopted was an accident prevention and service delivery model based on risk control. This means that our approach will shift from a reliance on inspection for code conformance as the primary safety tool to a multifaceted safety system called the Accident Prevention Model. The Accident Prevention Model concentrates on four areas or “pillars” to support the safety system: education and outreach, inspection, research and enforcement.

- **Education and outreach:** Increase the flow of information and knowledge between the BC Safety Authority, the public and industry through awareness campaigns, information sessions, code updates, bulletins, our website and on worksites.
- **Inspection:** Use risk-based inspection services to promote hazard prevention and ensure duty holders control the risks they create.
- **Research:** Conduct data gathering and analysis, enabling the BC Safety Authority to identify hazards and trends that will help industry to act and prevent incidents before they occur.
- **Enforcement:** “Level the playing field” and provide assurance that non-compliant contractors are made accountable.

The BC Safety Authority has adopted the Accident Prevention Model to improve the overall safety system in the province by systematically reducing hazards, preventing accidents and focusing our resources on high risk areas. This operating model will promote higher levels of self-compliance by our clients, resulting in more effective ways of improving safety.



OUR INDUSTRIES

Seven technologies are regulated by the BC Safety Authority. We assess new and operating equipment, license contractors and issue certificates of qualification to workers. In 2007, BC Safety Authority safety officers completed close to 70,000 inspections. There were 7,782 licensed contractors across all technologies and more than 50,000 individuals with certificates of qualification.

Amusement rides and recreational railways: We're responsible for verifying the safe installation and operation of the more than 200 amusement rides in British Columbia as well as overseeing the safety of the province's 18 recreational railways, which range from miniature 10-inch gauge trains to historical steam locomotives.

Boilers, pressure vessels and refrigeration: We oversee the design, construction and operation of steam and hot water boilers, refrigeration units and pressure vessels throughout the province. We license contractors who install and repair this equipment and we test and certify the power engineers who operate it.

Electrical: The BC Safety Authority inspects electrical installations at commercial, industrial and residential sites throughout British Columbia, except for those areas where the municipalities provide inspection services. We administer a licensing program for all electrical contractors in the province and certify all Field Safety Representatives¹, authorizing them to accept the responsibility for ensuring electrical contractors' work is completed in accordance with the *Electrical Safety Regulation*.

Escalators and elevators: We oversee the safety of the more than 20,000 passenger elevators, freight elevators, escalators, moving walks, handicapped lifts and construction hoists in the province. Our staff conducts design reviews, field verifications of new installations and periodic inspections of existing units, and we register contractors working on elevating equipment.

Natural gas and propane: We are responsible for overseeing the safe use of natural gas, propane, and digester, landfill and hydrogen gases in residences, commercial establishments and industrial facilities. The BC Safety Authority certifies all gas trade professionals and licenses all contractors in British Columbia. Inspections of residential installations are done by some municipalities; we conduct inspections of all other gas equipment in the province.

Passenger ropeways: The 225 tramways, gondolas, chairlifts, T-bars and tow ropes in 48 locations across the province are regulated by the BC Safety Authority. In addition to conducting safety inspections of new and existing units, we also work with industry associations and educational institutions to deliver safety training programs for passenger ropeway operators.

Railways: Provincially certified railways operating in British Columbia are regulated through a compliance program consisting of audits and inspections to certify that a railway's operations are being conducted safely. These railways include common carrier railways, industrial railways and commuter railways.

¹ A "Field Safety Representative" is an individual who holds a certificate of qualification issued under the Safety Standards General Regulation.

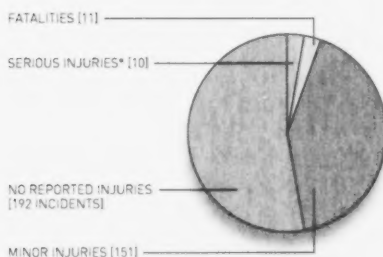
INCIDENT NOTIFICATION

INCIDENT NOTIFICATION IN 2007

There were 483 incidents reported to the BC Safety Authority in 2007. We investigated all reported incidents and concluded that 154 were not related to equipment or operations regulated by the BC Safety Authority; a majority of these "not related" incidents (129) were reported by commuter railways. In accordance with federal reporting requirements, commuter railways are required to report any incident that occurs on railway property; however, none were caused by railway equipment or operations. The data from these incidents has therefore not been considered in the analysis carried out for this report. In 2007, there were 329 reported incidents that were directly related to regulated equipment or operations.

TECHNOLOGY	INCIDENT NOTIFICATIONS RECEIVED	INCIDENTS NOT RELATED TO REGULATED EQUIPMENT OR OPERATIONS	INCIDENTS INCLUDED IN DATA
Amusement Rides	15	2	13
Recreational Railways	2	1	1
Boilers, Pressure Vessels, and Refrigeration	7	1	6
Electrical	108	10	98
Elevating Devices	51	2	49
Gas	62	3	59
Passenger Ropeways	92	6	86
Railways	146	129	17
TOTAL	483	154	329

SUMMARY OF TYPES OF INJURIES SUSTAINED**



* Permanent and Major Non-permanent injuries are classified as 'Serious injury'

** Railway incidents are not rated by severity and therefore are not represented in this chart

SUMMARY OF FATALITIES AND INJURIES IN 2007

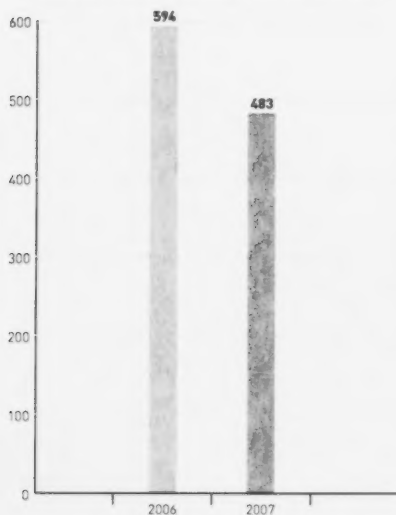
Since January 1, 2007, all incidents reported to the BC Safety Authority were classified and analyzed based on their severity, with the exception of railway incidents. Unlike the other technologies, railways are administered under the *Railway Act*. An agreement between the Province and the Transportation Safety Board of Canada adopts the federal reporting requirements for railways and therefore commuter and industrial railway incidents are reported to the BC Safety Authority but not classified by severity. In accordance with the agreement, accidents and incidents occurring on provincially regulated common carrier railways are reported directly to the Transportation Safety Board of Canada and are not published.

Other than railways, the outcome of each incident was recorded as no injury, minor non-permanent injury, major non-permanent injury, permanent injury or fatality. There were 11 fatalities and 161 injuries. No injuries were reported as the outcome of 192 incidents. Injuries or fatalities occurred in 137 incidents. Of the 161 injuries, 88% were minor injuries (consisting of lacerations, contusions, abrasions or other similar injuries).

REPORTED INJURY SEVERITY BY TECHNOLOGY 2007

TECHNOLOGY	NUMBER OF INJURIES SUSTAINED				TOTAL NUMBER OF INJURIES AND FATALITIES
	MINOR NON-PERMANENT	MAJOR NON-PERMANENT	PERMANENT	FATALITY	
Amusement Rides	10	1	0	0	11
Recreational Railways	0	0	0	0	0
Boilers, Pressure Vessels and Refrigeration	0	0	0	0	0
Electrical	39	2	0	6	47
Elevating Devices	41	2	0	1	44
Gas	13	3	0	4	20
Passenger Ropeways	48	1	1	0	50
Railways	DATA NOT AVAILABLE				
TOTAL	151	9	1	11	172

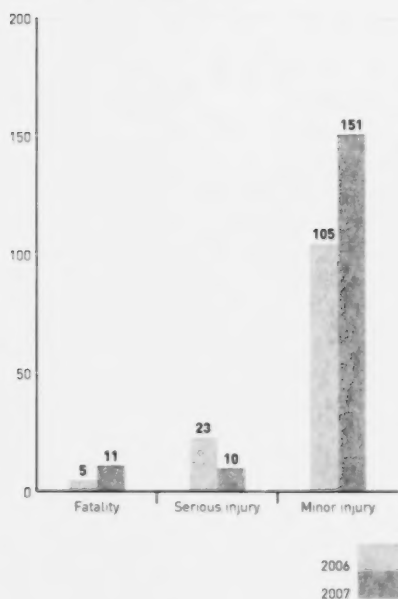
2006 AND 2007 INCIDENT NOTIFICATIONS



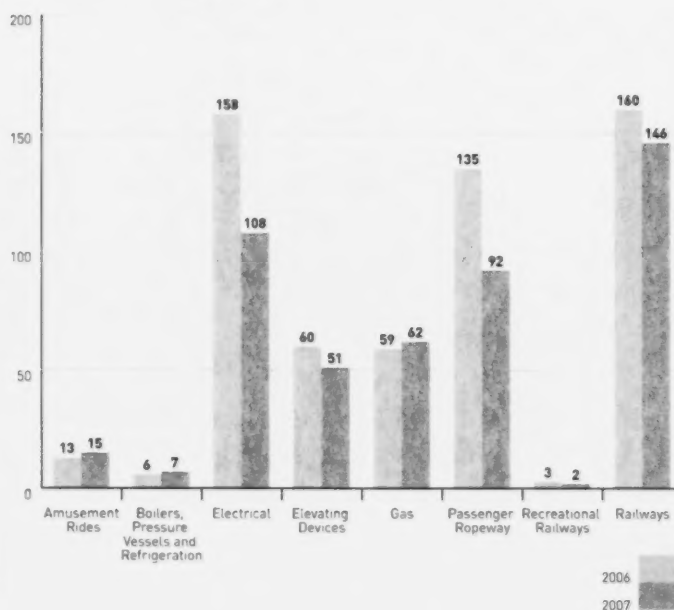
COMPARING 2006 AND 2007

The number of incident notifications for 2007 decreased 19% from 594 in 2006. A decrease in this number of over two years may not directly reflect increased safety performance. This is because the number of incident notifications received in each technical area is related to that industry's focus on safety and dedication to capturing safety statistics for prevention purposes as well as its knowledge of reporting requirements. A technology area with a mature safety management system, dedicated to capturing as much incident information as possible, reports a large number of incidents. This means a decrease in incident notifications may indicate poorer reporting and not a better safety record. Changes in incident numbers must be analyzed for long-term trends over several years before they can be considered a significant measure of safety system performance.

2006 AND 2007 INCIDENTS INVOLVING FATALITY AND INJURY



2006 AND 2007 INCIDENT NOTIFICATIONS BY TECHNOLOGY



IDENTIFYING POOR PERFORMERS

The BC Safety Authority initiated two programs in 2007 to identify poor performing contractors. The Gas Safety Program started a qualitative study where all safety officers identified poor performing contractors in their areas as well as the factors on which they based their determination. The compilation of these factors will be analyzed to establish a set of parameters for determining poor performance.

The second initiative was a quantitative study to develop a software program for identifying poor performing contractors and field safety representatives in the Electrical and Gas Safety Programs by analyzing data in our computerized work management system. This study was conducted in parallel with the Gas Safety Program study to provide comparison results and potentially be used to corroborate the findings of the Gas Safety Program study. To grade performance, this program evaluated three factors: disciplinary actions, inspection outcomes and hazards created by non-compliances. Poor performers were classified as minor (poor performance in one factor), major (poor performance in two factors) or severe (poor performance in three factors).

Although the electrical contractors had the highest percentage of poor performers, the Gas Safety Program will conduct further work in this area as a continuation of its poor performer study. In 2008, the parameters for measuring poor performers will be set, and the poor performers identified by the safety officers will be compared to the results of the computer program. Each safety officer will be responsible for developing an education and outreach program targeting the most severe poor performers in their respective inspection areas. The goal of the program is to work closely with the contractors to improve their performance so that the contractor will no longer be considered a poor performer. If education and outreach programs do not lead to improved performance, the enforcement tools authorized by the Safety Standards Act will be used to ensure compliance with safety regulations.

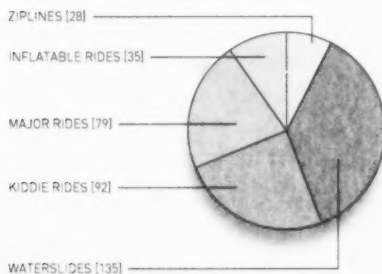
IDENTIFYING POOR PERFORMERS

GROUP	TOTAL NUMBER OF CONTRACTORS OR FIELD SERVICE REPRESENTATIVES	DEGREE OF POOR PERFORMANCE			PERCENTAGE OF POOR PERFORMERS
		MINOR	MAJOR	SEVERE	
Gas Contractors	2,168	169	60	10	11%
Electrical Contractors	4,467	511	88	16	14%
Electrical Field Safety Representatives	14,813	366	71	3	3%
Total	21,448	1,046	219	29	6%



AMUSEMENT RIDES AND RECREATIONAL RAILWAYS

TYPES OF AMUSEMENT RIDES
[Total number of amusement rides registered with BCSA = 369]



The BC Safety Authority oversees the safety of amusement ride installation and operation in accordance with the *Safety Standards Act* and the *Elevating Devices Safety Regulation*. The types of amusement rides regulated range from small single flume waterslides in hotels and inflatable play equipment to large major rides such as roller coasters operating at the Pacific National Exhibition. There were 369 active amusement rides registered with the BC Safety Authority in 2007.

Recreational railways include miniature gauge trains operated as rides and trains operated for historical interest and demonstration. These types of railways were defined as amusement rides and regulated under the *Safety Standards Act* and the *Elevating Devices Safety Regulation*. In 2007, there were 18 recreational railway operations in the province.

OVERVIEW - 2007

- Oversaw the operation of 369 amusement rides, including rides that travel between provinces
- Performed nearly 260 inspections in 2007
- A total of 15 incidents reported to the BCSA

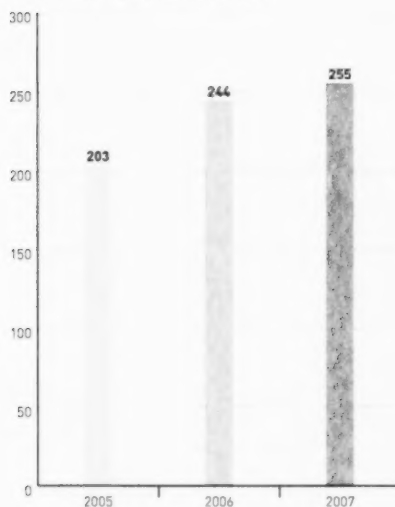
INSPECTION ACTIVITY IN 2007

In 2007, the number of active amusement devices in the province increased by 13% to 369. As well as carrying out inspections, safety officers sought out previously unregistered rides to coach and assist the operators with licensing. The purpose of these efforts was to bring these devices into conformance with provincial regulatory requirements and safety standards.

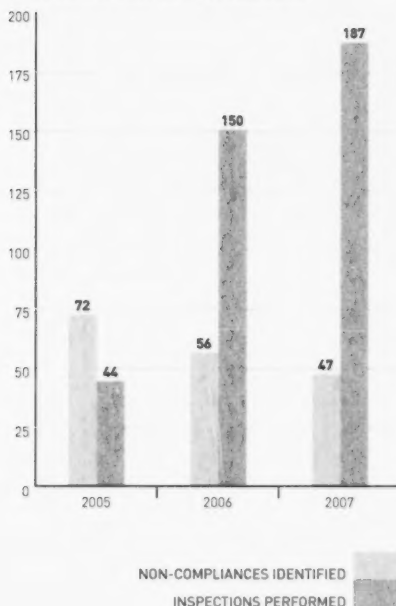
BC Safety Authority safety officers performed 255 inspections over the reporting period. This is an increase in the number of inspections completed in 2006 and is a result of our program to bring more amusement device operators into compliance with regulations.

There were 47 inspections completed on the 18 recreational railways operating throughout the province. With a total of 187 non-compliance issues identified, the average non-compliance per inspection was 3.97 – an increase over the 2006 average of 2.68. Track maintenance issues were the major non-compliances identified in 2006. Consequently, the inspections conducted in 2007 focused on track maintenance and identified more non-compliance issues than in previous years. Recreational railway operations are typically operated by non-profit organizations using volunteer staff. As such, there is often minimal investment and resources devoted to track maintenance; such work is expensive and requires many volunteer staff hours. To ensure adequate track maintenance and address these non-compliance issues, safety officers worked with the recreational rail operators to improve their Safety Management Systems and maintenance records.

**2005, 2006 AND 2007
INSPECTIONS PERFORMED**

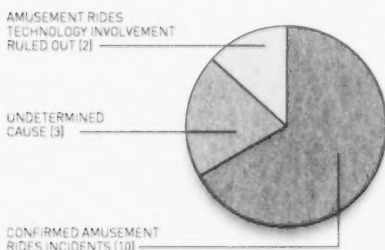


2005, 2006 AND 2007 RECREATIONAL RAILWAY INSPECTION RESULTS



INVESTIGATION OUTCOME OF REPORTED CASES

[Total number of reported cases = 15]



INCIDENTS IN 2007

There were 15 amusement ride incidents reported to the BC Safety Authority in 2007. Ten of these incidents were attributed to amusement ride operations, 3 of the incidents had undetermined causes and in 2 of the incidents the amusement ride technology was ruled out. These incidents resulted in serious injury to one individual and minor injuries to 10 individuals.

An incident occurred at a zipline² operation where a rider fell and sustained serious injuries when a safety harness was not properly secured to the zipline trolley. The BC Safety Authority used a root cause analysis to investigate the incident. Based on the findings of the root cause analysis, we have worked with the zipline operator to change several of its operating procedures to prevent this type of incident from reoccurring. We also issued a safety order to all zipline operators providing an overview of the incident and our investigation results³. The safety order required that zipline operators review their own procedures to ensure that similar incidents do not occur with their operations.

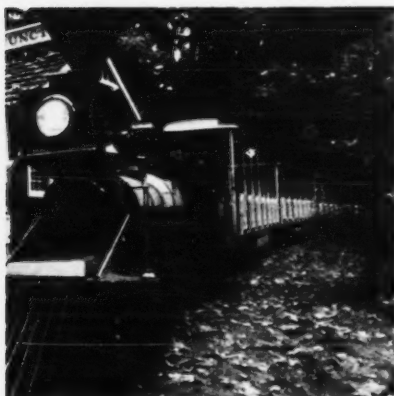
The National Amusement Device Incidents Analysis is a tool developed by a National Public Safety Advisory Committee's Task Group to create a national incident database for evaluating amusement ride safety risks across Canada. In 2007, the BC Safety Authority was one of three jurisdictions that contributed data for the first application of the tool and was one of five jurisdictions to participate in the first National Amusement Device Incidents Analysis Report. Our participation supports a national objective to encourage information sharing and communication for establishing best practices in public safety management.

When identified by cause, 70% of the 2007 amusement ride incidents in British Columbia were due to factors related to human behaviour, such as failure to observe safety rules, disregarding operators' instructions or operator inattention. Equipment problems were the cause of 30% of the incidents. The main identified causal factors in the national report were people-related factors (69%) and equipment (23%). The causal factors in British Columbia are typical for this industry when compared on a national basis. Although the equipment causal factor percentage is higher in British Columbia, the available data set is small and the difference is not considered to be statistically significant.

For recreational railways, there were 2 reported incidents. It was determined that one of these incidents was not related to recreational rail operations. The other was attributed to people not following prescribed procedures.

² A "zipline" is a wire rope suspended between two points, where a participant, with the use of a pulley, glides from the high point to the low point, propelled by gravity.

³ Safety Order No: SO-P4 070904 1 - Procedure and Training Review for Zipline Operators. Date of issue: September 4, 2007.



FUTURE OUTLOOK AND TRENDS

After reviewing the operations of recreational railways, the BC Safety Authority has realigned the administration of the two different types of railways covered by the recreational railway designation. The term recreational railways will no longer be used to describe operations that exist for the sole purpose of providing rides on rolling stock⁵. Examples of these operations are the West Coast Railway Association (Royal Hudson) and the Kettle Valley Steam Railway. In 2008, they will be designated as Heritage Railways and regulated under the Railway Act (BC). Eleven of the current 18 recreational railways will be designated Heritage Railways. The remaining seven small gauge train operations, such as the Stanley Park Miniature Railway and the Bear Creek Park Train, will be designated as Train Rides. They will continue to be regulated as amusement rides under the Elevating Devices Safety Regulation.

OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 100 OPERATING PERMITS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 100 OPERATING PERMITS
Fatality	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Major Non-Permanent Injury	1	0.27	1	0.27
Minor Non-Permanent Injury	9	2.44	10	2.71
Near-Miss	3	0.81	0	0.00
Total	13	3.52	11	2.98

IMPROVING PUBLIC SAFETY

In the 2006 State of Safety Report we described a major initiative to inspect all waterslides in the province and establish a baseline status for their operation. One significant finding was the number of slides allowing double riding, which is prohibited in all other Canadian jurisdictions. In the spring of 2007, a directive was issued to the amusement ride industry entitled "Multiple Riders in Waterslide Flumes"⁴. This directive was provided to ensure that waterslide amusement ride contractors were following the operating guidelines provided by various waterslide manufacturers. In specific cases, the manufacturer states that "the practice of multiple rider entry is absolutely prohibited." To ensure the safety of the public on waterslides, operators must follow the manufacturer's operating guidelines, which in some cases means prohibiting multiple riders.

Many amusement rides are defined by regulation as regulated products, but their operations have not been previously overseen by the BC Safety Authority as amusement rides. Both inflatable 'play equipment' and 'fun park bumper boats' are in this category. We have initiated an education and outreach program to promote the proper licensing and permitting of these devices. Ziplines are another type of amusement ride that is now regulated by the BC Safety Authority. There are 28 ziplines registered in the province, but this is anticipated to be a growing sector of the technology area and we anticipate that new zipline operations will open for business in 2008. The focus of the Amusement Rides Safety Program is on education and outreach to ensure owners and operators establish adequate regulated safety standards.

⁴ Directive No. D-P4 070426 4 - Multiple Riders in Waterslide Flumes. Date of issue: April 26, 2007

⁵ The Elevating Devices Safety Regulation defines "recreational railway" as an amusement ride operated on a set of rails, within or outside of the confines of a historical park or historical sites, for the sole purpose of providing to individuals rides on rolling stock.



BOILERS, PRESSURE VESSELS AND REFRIGERATION

The Boiler and Pressure Vessel Safety Program oversees the construction, installation and operation of boilers, pressure vessels and refrigeration plants in accordance with the *Safety Standards Act* and the *Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation*. In addition to ensuring the safe operation of this equipment, we review new boiler and pressure vessel designs prior to construction to ensure they meet safety code requirements. Through the Boiler, Pressure Vessel and Refrigeration Safety Program, the BC Safety Authority also administers the licensing of contractors and certification of power engineers.

OVERVIEW - 2007

- Performed more than 13,000 inspections
- Reviewed 2,218 design submissions
- Over 56,000 boiler, pressure vessel and refrigeration units granted operating permits

INSPECTION ACTIVITY IN 2007

In 2007, we issued 780 installation permits for new boilers and refrigeration systems, and there were more than 56,000 operating permits covering existing in-service equipment. Inspections were conducted on all new boiler, pressure vessel and refrigeration system installations. Periodic inspections of operating equipment were also conducted to ensure equipment was adequately maintained and operated safely. The timing of periodic equipment inspections depends on the safety risk associated with the equipment. Higher risk equipment is assessed annually, while lower risk units have an inspection period that can extend up to 6 years. Safety officers in the Boiler, Pressure Vessel and Refrigeration Safety Program performed 13,143 inspections in 2007; more than 12,000 of these were periodic inspections completed on in-service equipment.

Periodic inspections focus on the maintenance of equipment, and most problems found during inspections require repairs to the equipment necessitating a shutdown. Repairs are overseen by the safety officer and must be completed to the officer's satisfaction. These repairs are considered maintenance (not code compliance issues) and they are carried out before returning the equipment to service. The Certificate of Inspection, which is issued to attest that the equipment is suitable for service, will not list maintenance deficiencies. This aspect of the boiler and pressure vessel inspection process is unique to this program and as such, non-compliances per inspection, reported in other technologies, are not accurately tracked in the Boiler, Pressure Vessel and Refrigeration Safety Program at this time.



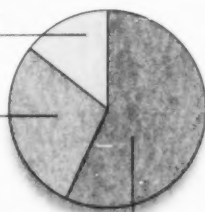
INVESTIGATION OUTCOME OF REPORTED CASES

[Total number of reported cases = 7]

BOILER, PRESSURE VESSEL
AND REFRIGERATION
TECHNOLOGY INVOLVEMENT
RULED OUT [1]

UNDETERMINED
CAUSE [2]

CONFIRMED BOILER,
PRESSURE VESSEL,
AND REFRIGERATION
INCIDENTS [4]



The potential energy stored in a boiler or pressure vessel can cause catastrophic damage if there is an equipment failure. As many vessels have a service life of 40 to 50 years, adequate maintenance, upkeep and repair are paramount for safe operation over this life span. Maintenance and repair issues remain the most common risk factors and the focus of our safety officers' inspections.

In 2007, we reviewed the design registration procedures for fittings. It was found that the manufacture of fittings such as flanges, valves, couplings and pressure relief devices had sufficient controls in place that design registration did not add significant safety value. As a result, specified categories of fittings are exempt from registration requirements effective April 2007⁶, thereby reducing regulations that had no added value for safety.

INCIDENTS IN 2007

There were 7 incidents reported in this technology. Four incidents were confirmed to be related to the technology, 2 incident investigations were inconclusive as to the cause and 1 report was determined to be unrelated to the technology.

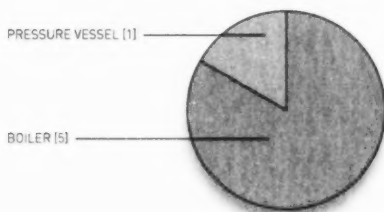
None of the reported incidents resulted in fatalities or injuries. Five boiler incidents caused damage to equipment, but the damage was limited to the boilers themselves. There was an incident on a pressure vessel where incorrect replacement parts were installed. This error was discovered by the equipment operators when the pressure vessel was being returned to service. The equipment was shut down and the proper parts installed before any damage occurred.

As in previous years, equipment failure was the leading cause of incidents in this technology in 2007. Ensuring that equipment owners carry out adequate maintenance, upkeep and repair on boilers, pressure vessels and refrigeration equipment will be the key to preventing incidents in the Boiler, Pressure Vessel and Refrigeration Safety Program. With the implementation of the Accident Prevention Model, safety officers' activities will shift from primary inspection to assessing and auditing maintenance activities and safety management plans.

OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 10,000 OPERATING PERMITS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 10,000 OPERATING PERMITS
Fatality	0	0.00	0	0.00
Permanent Injury	0	0.00	0	0.00
Major Non-Permanent Injury	0	0.00	0	0.00
Minor Non-Permanent Injury	0	0.00	0	0.00
Near-Miss	6	1.05	0	0.00
Total	6	1.05	0	0.00

⁶ Directive No: D-B5 070402 3 - Exemption from Registration Requirements for Category A, B, C and G Fittings. Date of issue: April 2, 2007.

EQUIPMENT INVOLVED IN BOILER, PRESSURE VESSEL AND REFRIGERATION CASES
[Total number of confirmed incidents = 6]



IMPROVING PUBLIC SAFETY

In 2007, we worked to improve incident reporting for this industry. By collecting more incident data, we will be able to improve this safety program. We issued a directive on incident reporting requirements that explained incident severity levels, mandatory reporting times and how to report incidents⁷. The directive also included a reporting form to easily record and fax information. This directive was distributed to equipment owners and contractors.

A number of public institutions, including hospitals and schools must adequately maintain their boiler and refrigeration plants while contending with budget restrictions. We planned and started an initiative to assist these institutions in identifying required maintenance. This included a presentation to public sector management organizations, representing school districts and health authorities from across the province, on risk management, the need for routine inspections and maintenance, acceptable standards and the requirements for hiring qualified personnel. The BC Safety Authority will continue to promote this risk management approach with our clients in 2008 by delivering similar presentations at industry conferences and meetings with operational staff.

⁷ Directive No: D-B6 070101 1 - Incident Reporting Requirements with Respect to Boilers, Pressure Vessels and Refrigeration Technology. Date of issue: January 1, 2007.

FUTURE OUTLOOK AND CHALLENGES

The Trade, Investment and Labour Mobility Agreement between British Columbia and Alberta seeks to reduce or eliminate barriers to trade, investment and labour mobility between the two provinces. In 2007, we reviewed the *Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation* to determine what changes were needed to implement the Trade, Investment and Labour Mobility Agreement.

An inter-provincial committee including representatives of the Alberta government and the Alberta Boilers Safety Association was formed by the BC Safety Authority to determine how to meet the obligations of the Trade, Investment and Labour Mobility Agreement. Broad-based stakeholder consultations on all proposed changes were held throughout British Columbia in November 2007. The majority of the proposed changes concern the qualifying time and education requirements for power engineering certifications and the scope of work permitted for each class of certification. These proposed changes, once fully implemented, will allow for seamless mobility for power engineers between British Columbia and Alberta. Additionally, the harmonization of terminology, plant classification and operator certification will provide a common base from which to obtain inspection and incident data; in cooperation with the Alberta Boilers Safety Association, future safety analysis and trending can use data from both British Columbia and Alberta, making research much more effective.

As we implement the Accident Prevention Model, higher levels of self-compliance by our clients will be required. The proposed changes to the regulation clearly mandate the owner's responsibilities for the safety of a plant and focus on self-compliance.



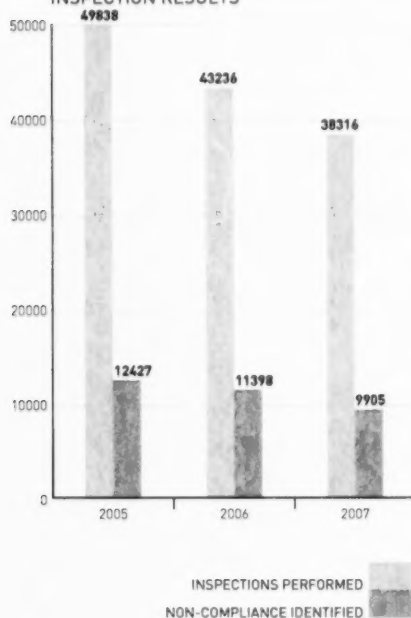
ELECTRICAL

The Electrical Safety Program oversees the safety of electrical systems across British Columbia through the administration of the *Safety Standards Act* and the *Electrical Safety Regulation*. The BC Safety Authority is responsible for delivering electrical safety services for all areas of the province with the exception of 8 municipalities: Burnaby, Maple Ridge, North Vancouver (City and District), Surrey, Vancouver, Victoria and West Vancouver. The electrical safety services we deliver cover all types of electrical installations in residential, commercial and industrial sites.

OVERVIEW - 2007

- Over 60,000 installation permits issued
- Performed over 38,000 inspections
- 14,813 certified Field Safety Representatives in the province

2005, 2006 AND 2007 ELECTRICAL INSPECTION RESULTS



INSPECTION ACTIVITY IN 2007

In 2007, we issued nearly 61,000 electrical installation permits and more than 6,000 operating permits. Using our risk-based approach, we identified the higher risk installations and inspected the work performed under these permits to confirm that it was done safely and properly. In addition to our inspections of high risk installations, the Electrical Safety Program certifies individuals as Field Safety Representatives. These individuals are responsible for ensuring that electrical work is performed in a manner that is consistent with the code and regulatory requirements. They are accountable for any non-compliance and must submit a legal declaration of compliance to the BC Safety Authority.

From 60,669 installation permits issued, 38,316 installations were identified as presenting sufficient risk to require inspection. Safety officers found non-compliance issues during 9,905 of these inspections, which represented 26% of the total inspection work. The past three years have seen a consistent non-compliance per inspection rate: 26% in 2006 and 25% in 2005. Non-compliance is a failure to comply with a code or safety regulation. In most cases, a failure to comply with a code or regulation will not present an imminent safety hazard; however, the rate of non-compliance is a measure of the quality of work carried out by contractors.

A major concern detailed in the 2006 State of Safety Report was electrical work performed without a permit, and un-permitted work continued to be an issue in 2007. Overall construction activity was very high throughout the province in 2007, leading to a shortage of licensed contractors available for electrical installation work. The lack of contractors was particularly prevalent for residential renovation work, where we saw an increase in un-permitted work by unlicensed contractors or homeowners. The BC Safety Authority has worked hard to identify such work, and in the many cases where we found numerous deficiencies, owners were required to hire licensed contractors to correct the deficient work. It is expected that construction activity will remain robust and this shortage of licensed contractors will continue at least through 2008.

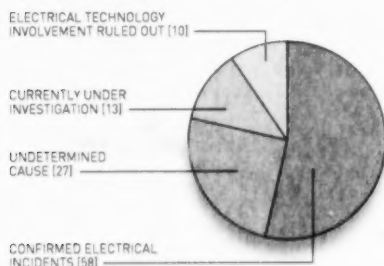
The Safety Standards Act permits Provincial Safety Managers to approve regulated products for use in British Columbia. However, there has been some uncertainty about the types of electrical equipment the BC Safety Authority should be inspecting and approving. In 2007, the BC Safety Authority clarified its role in the approval of electrical equipment⁶. In most circumstances, these services are provided by approval agencies certified by the Standards Council of Canada. Agencies approved by the Standards Council of Canada do not provide approval services for all types of equipment, such as approval for used manufactured homes or structures. The Electrical Safety Program will conduct approvals where such services are not otherwise provided.

⁶ Information Bulletin No. B-E3 071019 3 - Approved Certification Marks for Electrical Products. Date of issue: October 19, 2007.

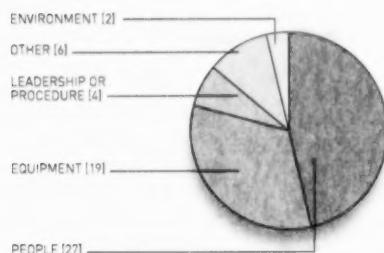




INVESTIGATION OUTCOME OF REPORTED CASES [Total number of reported cases = 108]



ELECTRICAL INCIDENTS BY IDENTIFIED CAUSE [Total number of confirmed incidents = 58]



INCIDENTS IN 2007

In 2007, 108 possible incidents involving electrical equipment were reported to the BC Safety Authority. Investigation ruled out the involvement of electrical equipment in 10 of the reported incidents, and in 27 cases, the exact cause of the incident could not be determined. Many undetermined causes were for fires where there was insufficient evidence remaining to allow investigators to conclude a cause.

The majority of electrical incidents were fires started by faulty equipment or equipment used in an inappropriate manner. The primary cause of these incidents was people improperly using equipment, using electrical devices for unintended purposes or not maintaining equipment in good operating order. Some examples of these incidents include leaving operating heaters unattended, placing equipment too close to combustibles and overloading circuits. Many of these accidents occurred because people were not knowledgeable about proper operating, maintenance or safety precautions.

There were 6 incidents involving fatalities reported in 2007. In 5 incidents, individuals died as a result of fires. In only 1 case could the source of the fire be reliably traced to faulty electrical equipment. In many investigations, the fire damage was so extensive that there was little or no evidence with which to determine a source of ignition. Electrical equipment could not be stated as the cause of the fire nor could it be decisively ruled out. There was 1 death from electrocution, where the victim was attempting to steal copper cable from a high voltage power substation.

IMPROVING PUBLIC SAFETY

The 2006 edition of the Canadian Electrical Code became effective in British Columbia in February 2007. One of the changes in the latest edition of the Canadian Electrical Code required the use of ground fault circuit interrupters on temporary construction power installations.

OUTCOME	TOTAL NUMBER OF INCIDENTS	HOUSEHOLD INCIDENTS	INCIDENTS PER 100,000 HOUSEHOLDS	NON-HOUSEHOLD INCIDENTS	INCIDENTS PER 10,000 NON-HOUSEHOLD PERMITS	TOTAL NUMBER OF INJURIES AND FATALITIES
Fatality	6	4	0.36	2	0.30	6
Permanent Injury	0	0	0.00	0	0.00	0
Major Non-permanent Injury	2	1	0.09	1	0.15	2
Minor Non-permanent Injury	14	7	0.63	7	1.05	39
Near Miss	76	46	4.17	30	4.49	0
Total	98	58	5.25	40	5.99	47

The new regulation invalidated WorkSafeBC's regulations governing the use of assured grounding programs and at some job sites the new ground fault circuit interrupter requirements were unworkable. The BC Safety Authority, WorkSafeBC and concerned industry stakeholders partnered to develop a directive⁹ providing guidance on the new requirements for the use of ground fault circuit interrupters at construction sites. A variance allowing the use of WorkSafeBC's assured grounding program, for situations where the new Canadian Electrical Code requirements for ground fault circuit interrupters were not feasible, was also completed.

In the spring, the large snow pack in British Columbia's mountains threatened to flood the Fraser River basin and other river systems in the province. The BC Safety Authority, in cooperation with the Provincial Emergency Program, Terasen Gas, BC Hydro and the Propane Gas Association of Canada, instituted new emergency protocols to allow for the rapid and safe re-establishment of both electrical and natural gas services in flooded areas¹⁰.

The BC Safety Authority launched a "Heads Up For Safety" public awareness campaign with the goal of educating homeowners about the importance of using licensed contractors instead of doing home renovation work themselves or employing unlicensed freelancers. Results from a pilot project in the Okanagan showed an increase in contractor permits and a decrease in homeowner permits. As a result of the success of this pilot, the awareness campaign was launched throughout the province in October 2007.



FUTURE CHALLENGES

The sale and use of unapproved electrical equipment with counterfeit certification marks continued to grow in 2007. These products are often undistinguishable from legitimate equipment but are manufactured from inadequate or substandard materials that make them unsafe. Electrical equipment makes up part of a worldwide, multimillion dollar counterfeit business. The growth of online commerce has led to challenges in controlling the importation of these substandard, unsafe products. We will work with the certification agencies reporting the counterfeiting of their registered trademarks when counterfeit products are discovered by our safety officers. The certification agencies will conduct investigations to identify all parties and products involved, destroy and dispose of the illegally marked products and, in cooperation with law firms, prosecute the offenders.

With continuing high metal prices, the theft of copper wiring (particularly that used for equipment grounding) is expected to remain an issue. In response, manufacturers are developing new installation techniques that hide cables, utilities are developing alternate materials for use in exposed locations, and educators are developing materials for public awareness. Aside from the cost to owners and contractors to replace damaged installations, the removal of this cable can pose a safety risk in the event of equipment failure or lightning strike. People who steal these cables are at significant risk of electrocution, and one death was recorded in 2007 from this activity. The BC Safety Authority is monitoring the effectiveness of the programs initiated by the manufacturers and utilities, to combat theft and if necessary will implement additional safety policies.

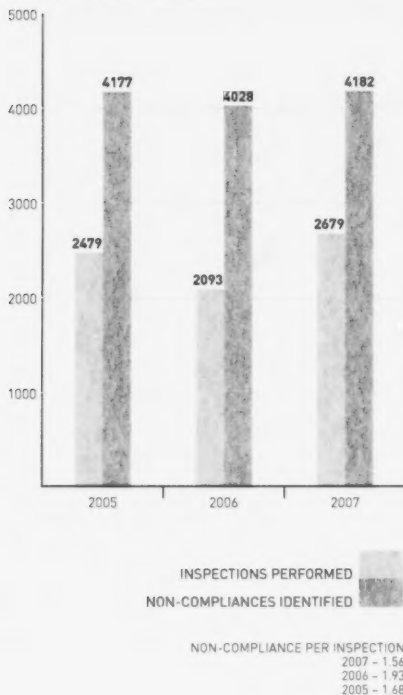
⁹ Directive No. D-E3 071101 8 - Section 76 - Temporary Wiring, Date of issue: November 1, 2007.

¹⁰ Information Bulletin No. B-E3 05 070608 2 - Emergency Post-Flood Protocol for Re-energizing Electrical and Gas Equipment, Date of issue: June 8, 2007.



ELEVATING DEVICES

2005, 2006 AND 2007 ELEVATING DEVICE INSPECTION RESULTS



The BC Safety Authority is responsible for overseeing the safety of elevators, escalators, moving walkways, dumbwaiters, lifts and construction hoists in accordance with the *Safety Standards Act* and the *Elevating Devices Safety Regulation*.

OVERVIEW - 2007

- More than 20,000 active elevating devices in 2007
- Performed nearly 4,200 inspections on new and existing units

INSPECTION ACTIVITY IN 2007

There were 20,666 elevating devices registered with the BC Safety Authority in 2007. Both existing units and new installations are reflected in this total. Over the course of the year, our safety officers conducted 4,182 inspections. Inspection of all new elevating device installations by the BC Safety Authority is mandatory before the new units are certified for operation. In 2007, we started to shift our inspection focus to in-service elevating devices. These units were inspected on a periodic basis using a risk assessment program to identify high risk units. One safety officer was appointed to full-time in-service inspections, and increased resources enabled us to conduct more inspections in 2007. By their very nature, high risk, in-service units had more non-compliances than new installations and therefore the average non-compliance per inspection also increased.

An average of 1.56 non-compliance issues per inspection was identified, down from the 2006 average of 1.93. The 2007 non-compliance average is comparable to 2005 and therefore the downward trend for 2007 may not necessarily be an indication of improving performance. More than 3 years of historical data is required before definite trends can be identified.

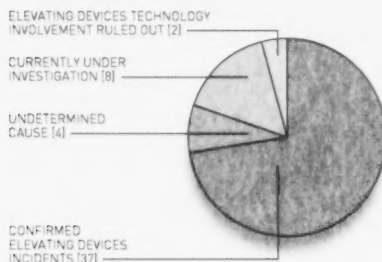
INCIDENTS IN 2007

There were 51 incidents reported to us in 2007. Eight of these incidents remain under investigation; however, interim results indicate that elevating devices were directly involved in the incidents. The reports on closed investigations concluded that 2 of the incidents were unrelated to an elevating device, 4 of the incidents had an undetermined cause and 37 incidents involved elevating devices. There was 1 fatality, 2 major injuries and 39 minor injuries from these incidents.

An elevator maintenance mechanic was killed when he was crushed between the elevator car cab and the hoistway wall. Investigation of this fatality was led by WorkSafeBC with the assistance of BC Safety Authority safety officers. The accident was a result of unsafe work practices. Two major injuries occurred when elevators stopped at incorrect positions in the shaft and people fell entering or exiting the elevator.

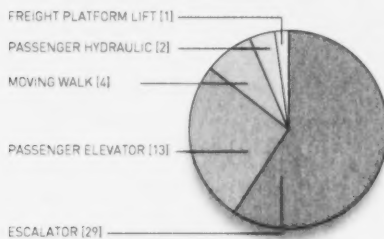
INVESTIGATION OUTCOME OF REPORTED CASES

[Total number of reported cases = 51]



EQUIPMENT INVOLVED IN ELEVATING DEVICES INCIDENTS

[Number of incidents involving elevating devices = 49]

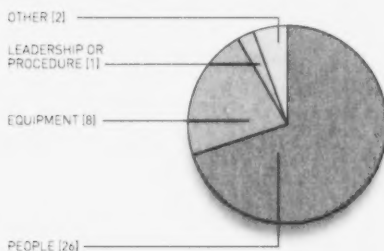


Escalators and moving walkways accounted for 61% of the incidents; however, injuries related to this equipment were primarily minor, consisting of cuts, bruises or sprains. When broken down by cause, 70% of the incidents were due to people-related factors such as tripping or falling when riding elevating devices; only 22% were caused by equipment failure or malfunction.

OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 1,000 OPERATING PERMITS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 1,000 OPERATING PERMITS
Fatality	1	0.05	1	0.05
Permanent Injury	0	0.00	0	0.00
Major Non-Permanent Injury	2	0.10	2	0.10
Minor Non-Permanent Injury	39	2.00	41	2.10
Near-Miss	7	0.36	0	0.00
Total	49	2.51	44	2.25

ELEVATING DEVICES INCIDENTS BY IDENTIFIED CAUSE

[Total number of confirmed incidents = 37]



IMPROVING PUBLIC SAFETY

The analysis of incident data revealed that there were many reoccurring incidents such as trips or falls on escalators and accidents involving shopping carts on moving sidewalks. We initiated two programs with the goal of improving public safety.

A number of published studies indicated that children were involved in a large percentage of escalator accidents. In response, we delivered an escalator rider safety program for school-age children which was developed by the Elevator Escalator Safety Foundation. This program was presented at two primary schools where the escalator safety message reached over 240 children. A similar program will be used as part of future education and outreach initiatives to deliver key safety messages to target audiences.

A root cause analysis was carried out as part of a study on accidents on moving sidewalks. Four moving sidewalks in one mall accounted for 87% of the incident reports for these types of devices. The analysis highlighted an equipment problem with the wheels of the carts and recommended safety measures to prevent further accidents. The owner of these sidewalks implemented these measures and there have been no further incidents.

In 2006, the Elevating Devices Safety Program started developing professional standards for the training and qualification of elevating device mechanics. This work continued throughout 2007. An ad hoc



FUTURE OUTLOOK AND TRENDS

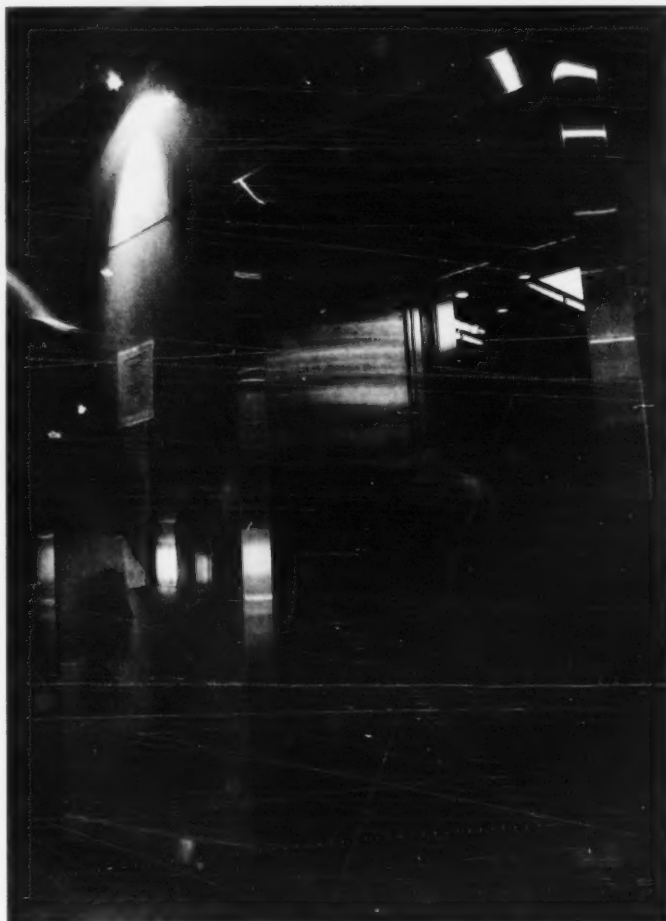
Recent national studies in the United States on escalator-related injuries indicate that injuries to older adults from slips, trips or falls doubled between 1991 and 2005. Early analysis on our initial data indicates a similar trend. Lack of attention and due care when riding an escalator was the cause of the majority of incidents. Educating riders about the safe use of escalators will be a key tool to help us reverse this trend. Escalator rider safety programs can be expanded to target older adults as well as children.

Currently, as is common in most provinces, residential elevators and wheelchair lifts are not regulated. Without standards for installation, maintenance or certification, these elevating devices are a safety risk. The Elevating Devices Technology Committee has formed an ad hoc issue group to study:

- How these devices are regulated in other areas,
- The safety risk they create,
- Companies working in this area who may be possible partners in education and self-regulation programs, and
- Requirements for future policy development.

committee of the Elevating Devices technology committee has developed a framework to address the current and future certification needs for the technology and is finalizing its recommendations.

Also initiated in 2006 was a campaign to ensure that elevating device owners conformed to regulatory requirements for maintenance contracts. A concerted effort in 2007 reduced the number of owners not in compliance from approximately 20,000 to 1,500. The BC Safety Authority will work with those owners not in compliance to establish the required maintenance programs.





Through its administration of the *Safety Standards Act* and the *Gas Safety Regulation*, the Gas Safety Program is responsible for the safety of gas distribution systems and any equipment using natural gas, propane, hydrogen or digester and landfill gas.

In 2007, the BC Safety Authority issued over 39,000 installation permits and almost 2,200 operating permits. The scope of installation permits includes a broad range of gas equipment from residential hot water tanks to burners for large boilers producing steam for electrical power generation or industrial processes. Operating permits are issued for such activities as utilities delivering gas, stations dispensing propane or facilities converting vehicle fuel systems to natural gas and propane.

We currently provide gas safety services for nearly 1.2 million homes throughout British Columbia. This figure excludes homes in Burnaby, Kelowna, Maple Ridge, North Vancouver (City and District), Richmond and Vancouver, where gas safety services are provided by municipal governments.

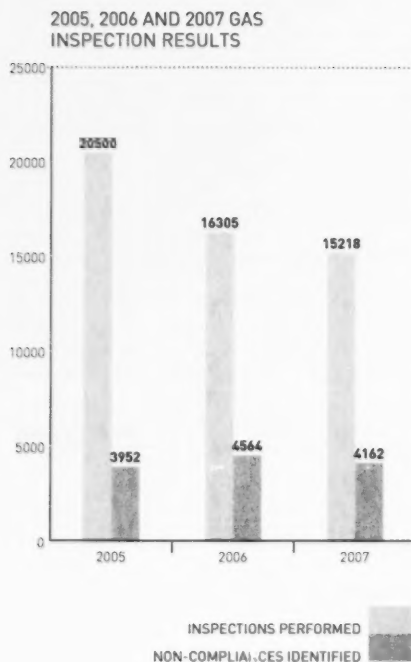
OVERVIEW - 2007

- 2,168 gas contractors and 12,467 gas fitters in the province
- Issued 39,889 installation permits and 2,196 operating permits
- Performed 15,218 inspections

INSPECTION ACTIVITY IN 2007

The Gas Safety inspection program uses a risk-based approach. In 2007, a new risk assessment program was developed and implemented. Targeting higher risk installations, safety officers conducted more than 15,000 inspections. Non-compliance problems requiring corrective actions were noted in 4,162 of the inspections for a non-compliance per inspection rate of 27%, consistent with the 2006 rate of 28% but an increase over the 2005 rate of 19%. Non-compliance is a failure to comply with a code or safety regulation and in most cases will not present an imminent safety hazard. The rate of non-compliance is a measure of the quality of work carried out by contractors. This increase in the non-compliance rate is an indication of poorer performance; the goal of the program to identify and work with poor performers is to reverse this trend.

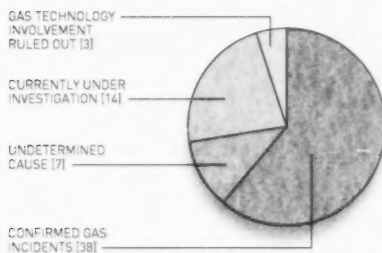
When the inspection data is reviewed, the majority of non-compliance issues do not constitute immediate safety problems. However, there were cases where gas contractors had done unsafe equipment installations, repeatedly carried out the same infraction on multiple occasions or did not correct non-compliance problems in a timely manner. In these situations, contractors were required to attend





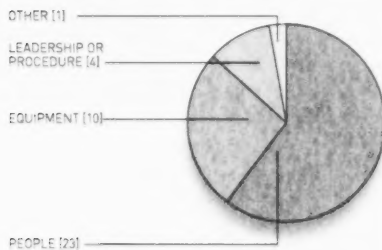
INVESTIGATION OUTCOME OF REPORTED CASES

[Total number of reported cases = 62]



GAS INCIDENTS BY IDENTIFIED CAUSE

[Total number of confirmed incidents = 38]



disciplinary review meetings. Twelve meetings were conducted in 2007 to make contractors aware of the seriousness of the problem and develop a specific educational program to correct the poor performance. There was one suspension of a licence until the contractor completes an upgrade course and one suspension of permit privileges was invoked.

INCIDENTS IN 2007

Sixty-two incidents involving gas equipment were reported in 2007. Subsequent investigation established that gas equipment was directly involved in 38 of the reported incidents. Association with gas equipment was ruled out in 3 cases and the causes of 7 incidents were not determined. Gas is often considered as a potential cause of fires that result in extensive damage, yet conclusive evidence linking these incidents to gas was not found. Fourteen incident investigations remained open at the time of publication. Many of these open incident investigations have equipment failure as a causal factor and the investigation follow-up requires actions from an equipment certification agency, including a review of the certification procedures, manufacturing process or equipment design. The review and correction of equipment deficiencies by the manufacturer and certification agencies can often extend beyond 12 months.

The total number of reported incidents does not include damage to underground gas distribution systems or "line hits" where buried gas lines are struck, punctured or otherwise damaged during excavation work, street repairs or the digging of postholes for fences. Gas utility companies operating distribution systems are responsible for having in place the emergency procedures and crews necessary to safely repair damaged gas lines. Consequently, line hits are reported directly to the gas utilities. The BC Safety Authority receives regular reports from the utilities on the number of line hits and their outcomes. In most cases, the gas lines are repaired and returned to service without incident. We will investigate serious incidents where public safety may be compromised and we will pursue repeat offenders with a program of education supported with enforcement to prevent reoccurrences. In 2007, there were 1,750 line hits reported by gas utilities.

As identified in the 2006 State of Safety Report, people-related factors remain the principal cause of confirmed gas technology incidents, accounting for 68% of incidents. Human error accounted for 57% of the confirmed incidents and 11% of the incidents were attributed to people making procedural errors. In most cases, safety officers found that people were unaware of appropriate precautions, proper operating procedures or maintenance requirements for ensuring gas equipment was reliable and safe.

There were 4 gas technology related fatalities in 2007. Two people were killed in a deliberately ignited gas explosion and the fire that followed. This incident was investigated as a crime by the police.

Two fatalities were caused by carbon monoxide poisoning that occurred in a recreational cabin. The source of the carbon monoxide was determined to be a propane refrigerator, where the installation did not meet code requirements. A carbon monoxide detector, designed to shut down the refrigerator when excess carbon monoxide was detected, had been disabled. There was no application made for an installation permit for this appliance, and its installation was therefore never inspected by a safety officer. A root cause analysis was carried out as part of our investigation. The recommendations from this analysis included public education programs covering the proper installation, operation and maintenance of propane refrigerators as well as proposals for changes to the Canadian Standards Association codes and standards that would help prevent similar accidents. These code changes will be brought forward to the code committees at the annual meetings in 2008.

Carbon monoxide from a gas heating appliance also resulted in the hospitalization of 6 people when the vent terminal of the appliance was dislodged. A lack of understanding of the sources and dangers of carbon monoxide is the most prevalent cause of fatalities and serious injuries in the gas technology.

OUTCOME	TOTAL NUMBER OF INCIDENTS	HOUSEHOLD INCIDENTS	INCIDENTS PER 100,000 HOUSEHOLDS	NON-HOUSEHOLD INCIDENTS	INCIDENTS PER 10,000 NON-HOUSEHOLD PERMITS	TOTAL NUMBER OF INJURIES AND FATALITIES
Fatality	2	1	0.08	1	0.24	4
Permanent Injury	0	0	0.00	0	0.00	0
Major Non-permanent Injury	1	1	0.08	0	0.00	3
Minor Non-permanent Injury	10	8	0.67	2	0.48	13
Near Miss	46	23	1.93	23	5.48	0
Total	59	33	2.77	26	6.20	20



IMPROVING PUBLIC SAFETY

Inspection and incident investigation data for 2007, as well as from previous years, repeatedly points to a lack of public awareness regarding safety precautions for the proper operation of the gas equipment used daily throughout the province. Education and outreach are key programs for accident prevention in the Gas Safety Program.

Building on our partnership program established in 2006 with the Motor Vehicle Sales Authority of British Columbia to certify gas equipment on recreational vehicles when they are sold, we worked with the recreational vehicle industry and propane suppliers to develop a recreational vehicle safety brochure that was widely distributed through our offices and the recreational vehicle industry.

In a pilot project to reduce line hits, BC Safety Authority staff in the Kelowna area worked with the gas utility to identify the excavating companies that had repeatedly damaged underground gas lines. Fourteen "repeat hitters" having 3 or more line hits were identified. Safety officers held meetings with each of these companies to discuss their regulatory responsibilities, excavating procedures and line locating policies and, if necessary, update their procedures for excavating in the vicinity of underground gas lines. There was a marked improvement in the safety performance of all the repeat hitters and this education program will be extended to other areas of the province in 2008.

The BC Safety Authority was very active in national code and standards development in 2007, participating in 20 committees developing or revising standards for natural gas, propane and hydrogen equipment, fuel cells and fuelling stations.

FUTURE OUTLOOK AND TRENDS

Vancouver is home to many fuel cell development companies. Together, they represent the largest cluster of fuel cell expertise in the world and are centered around the National Research Council's Institute for Fuel Cell Innovation. Many of these companies are conducting demonstration projects as the first steps on the road to commercializing their products. Hydrogen-powered buses and trucks, fuelling stations, fuel cell vehicles, fuel cell power supplies and micro fuel cells are some of the projects that we have already reviewed or will be approving in 2008. As British Columbia prepares to host the world for 2010, the goal is to show Canada as a destination for investment, research and implementation in "green" hydrogen fuel cell technologies. The BC Safety Authority's responsibility for overseeing the safety of these projects is challenging as this is a new technology and many safety standards are only in the development process. We will continue to work with industry to ensure the safe development of this technology.



PASSENGER ROPEWAYS

INVESTIGATION OUTCOME OF REPORTED CASES

[Total number of reported cases = 92]

PASSENGER ROPEWAYS
TECHNOLOGY INVOLVEMENT
RULED OUT [6]

UNDETERMINED
CAUSE [4]

CONFIRMED
PASSENGER ROPEWAYS
INCIDENTS [82]



The Passenger Ropeways Safety Program oversees the safety of the passenger ropeways throughout the province. Examples of passenger ropeways include tramways, gondolas, chairlifts, rope tows and passenger conveyors. We inspect new, operating and modified units in accordance with the *Safety Standards Act* and the *Elevating Devices Safety Regulation*.

OVERVIEW - 2007

- 228 passenger ropeways operating in British Columbia
- Approximately 5.7 million skier/rider visits during the 2006/2007 ski season
- Conducted nearly 220 inspections

INCIDENTS IN 2007

OUTCOME	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER 100,000 SKIER/RIDER VISITS	TOTAL NUMBER OF INJURIES OR FATALITIES	INJURIES PER 100,000 SKIER/RIDER VISITS
Fatality	0	0.00	0	0.00
Permanent Injury	1	0.02	1	0.02
Major Non-Permanent Injury	1	0.02	1	0.02
Minor Non-Permanent Injury	48	0.84	48	0.84
Near-Miss	36	0.63	0	0.00
Total	86	1.51	50	0.88

PASSENGER ROPEWAY INCIDENTS BY IDENTIFIED CAUSE

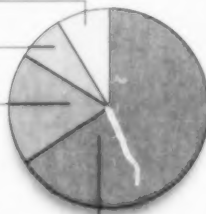
[Total number of confirmed incidents = 82]

ENVIRONMENT [7]

LEADERSHIP AND
PROCEDURE [6]

EQUIPMENT [15]

PEOPLE [54]

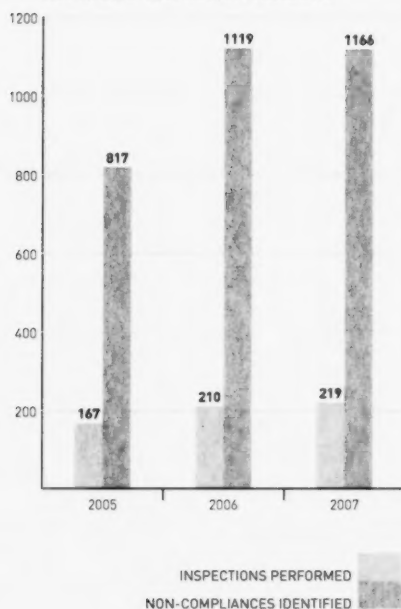


We received 92 incident notifications in 2007, of which 86 involved the passenger ropeways technology. All but 2 incidents resulted in minor injury and most incidents involved incorrectly loading and unloading the passenger ropeways. These incidents were due to rider behaviour, such as riders not lowering the safety bar, horseplay and entanglement with equipment. People who were experienced skiers/riders as well as those new to snow sports were involved. Accordingly, we are increasing efforts to address falls and incidents in loading areas.

One incident resulted in permanent injury when an employee was performing maintenance on equipment. The incident investigation revealed procedural problems with employee training and the posting of proper maintenance procedures; however, these non-compliances have been addressed. In one other case, a passenger was hit by the carrier when loading and sustained major non-permanent injuries. The operators have since revised the loading procedures for the chairlift.



2005, 2006 AND 2007 PASSENGER ROPEWAYS INSPECTION RESULTS



While our reporting cycle is a 12-month period running from January to December, the snow sport industry measures activity by ski season, from November to April. We take into account this difference in preparing our reports. Although the number of reported cases appears to be high, the number of injuries represents less than 0.002% of the 5.6 million to 6 million riders the technology serves.

The continued efforts by the snow sport industry to report incidents are a testament to the industry's commitment to participate in the safety system. In reporting near-misses and incidents, both the BC Safety Authority and industry benefit from the ability to actively monitor trends.

INSPECTIONS IN 2007

With 5.7 million skier/rider visits in the 2006/07 ski season and with the industry predicting the same volumes for the 2007/08 season, our safety officers were prepared for a busy pre-season testing and commissioning new and modified equipment. Our safety officers oversaw nearly 20 new installations, conducted 219 inspections and uncovered 1,166 non-compliances at 48 locations throughout BC.

In 2007, the BC Safety Authority oversaw the first construction phase of the largest passenger ropeway installation in North America: the tri-cable gondola spanning 4.4 kilometres at 415 metres above Fitzsimmons Creek in Whistler, BC. We will continue to work with the contractor through 2008 to ensure the gondola will meet code and regulatory requirements.



FUTURE OUTLOOK AND TRENDS

With the approach of the 2010 Olympic and Paralympic Games and BC's exposure as a premier winter destination, we are expecting increased volumes of skiers and increased demand on our passenger ropeways. The replacement and modification of older equipment and installation of new passenger ropeways will continue throughout the province.

One of the BC Safety Authority's objectives is to promote safety through education; we hope to continue and even increase our work with education providers. The Passenger Ropeway Safety Program continues to work with the Canada West Ski Areas Association and Selkirk College to provide teaching assistance for lift mechanics. With our participation, we hope to increase the knowledge of the people operating and maintaining passenger ropeways, thereby promoting increased levels of safety.

IMPROVING PUBLIC SAFETY

In 2007, we required all contractors operating passenger ropeways to provide the BC Safety Authority with a Safety Management Plan¹¹. All Safety Management Plans¹² submitted to us have been evaluated for acceptance. As we implement the Accident Prevention Model, the Passenger Ropeways Safety Program is planning to audit the Safety Management Plans in 2008. By requiring passenger ropeway contractors to hold a Safety Management Plan and auditing for compliance to the plans, we are laying the foundation for increased levels of safety.

Using data from reported incidents, the BC Safety Authority noted an increase in falls from carriers. In 2007, we continued to monitor the trend in falls from carriers and researched it through a root cause analysis process. After completing the analysis, we asked passenger ropeway operators to review their operating procedures¹³ based on the recommendations from the root cause analysis. BC Safety Authority staff also attended Canada West Ski Areas Association meetings and presented seminars to lift operations staff and managers about falls from carriers. Despite numerous education programs about the number of skiers falling from carriers, these falls remain a problem. Efforts to correct this trend include seminars, new requirements for lift operators and facility management, and educating snow sport school instructors on correct loading and unloading procedures.

In late 2007, we began researching other methods to change rider behaviour and we are looking into various methods to educate younger riders, who fall from carriers more frequently than riders in other age groups.

¹¹ Directive No. D-P4 070221 3 - Safety Management Plans Required for Passenger Ropeway Contractors. Date of issue: February 21, 2007.

¹² A Safety Management Plan is a documented strategy covering activities, assets and actions used to implement the organizational structure, responsibilities, procedures, capabilities and resources to ensure the individual performing regulated work will satisfy safety objectives and function as intended.

¹³ Information Bulletin No. B-P4 070301 1 - Passengers Falling from Carriers on Above-Surface Passenger Ropeways. Date of issue: March 1, 2007.



The BC Safety Authority regulates railway companies that operate solely within the province of BC and have a Minister's Certificate issued by the provincial Ministry of Transportation. These provincial railways are subject to the provincial *Railway Act*, the *Railway Safety Act* and the adopted federal railway safety legislation. Railway companies that operate nationally, such as Canadian Pacific, Canadian National, Burlington Northern Santa Fe and VIA Rail, are not under the jurisdiction of the provincial Ministry of Transportation but are regulated by Transport Canada.

The Railway Safety Program is unique within the BC Safety Authority as it is the only technology not governed by the *Safety Standards Act*.

OVERVIEW - 2007

- 65 railways holding a Minister's Certificate in the province
- Spent almost 2,200 hours conducting audits and safety assessments of railway operations

In 2007, the Railway Safety Program regulated 3 classes of railways:

- **Common Carrier**, which transport passengers or goods and interchange rolling stock with other railways
 - 5 active railways
- **Industrial**, which serve and move rolling stock at an industrial site exclusively
 - 47 active operations
- **Commuter**, which provide rail transportation for passengers between urban and/or suburban locations
 - 1 active railway
 - 1 under construction

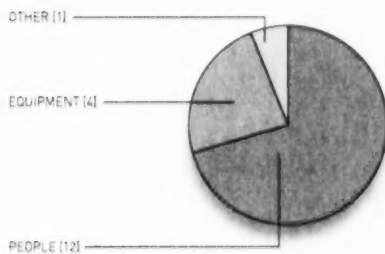
INSPECTION ACTIVITY IN 2007

Safety officers took a multifaceted approach – encompassing a railway's construction, operation and maintenance – when conducting audits and safety assessments. Assessments were based on a railway's approved Safety Management System. Depending on the size and complexity of the railway's operations, a single audit can extend over several days. Consequently, the Railway Safety Program has historically recorded its activities in terms of hours rather than the number of inspections, the method typically used in other sections of this report. In 2007, railway safety officers compiled a total of 2,192 hours conducting safety assessments of the three classes of railway operations.

Increasing the education and skills of our staff is very important as the BC Safety Authority implements the Accident Prevention Model. In 2007, safety officers completed audit training to better assess railway Safety Management Systems. An audit of the commuter rail operator's safety management system was carried out over a one-month period, during which the operator's procedures were reviewed. Passenger handling was the highest identified risk and therefore these procedures were the subject of the audit. There were no major safety issues identified by this audit and a compliance rating of 80% was achieved.

The increased field presence of safety officers also resulted in the discovery of approximately 40 industrial railways without Minister's certificates. The Railway Safety Program will work with these railways to develop and implement Safety Management Systems so that they can obtain the required certificates. Additionally, many railway spurs have been abandoned by inter-provincial railways over the past decade and rail operations on these spurs have been taken over by new operators, many of whom have not been previously regulated. These operations will also have to implement Safety Management Systems so that they can obtain the required certificates.

**INDUSTRIAL RAILWAY INCIDENTS
BY IDENTIFIED CAUSE**
[Total number of confirmed incidents = 17]



INCIDENTS IN 2007

Accidents and incidents occurring on provincially regulated commuter and industrial railways are reported to the BC Safety Authority in accordance with federal reporting requirements. Accidents and incidents occurring on provincially regulated common carrier railways are reported to the Transportation Safety Board of Canada in accordance with an agreement with the provincial government and are not published.

There were a total of 146 incidents reported on industrial and commuter railways. Incidents on common carrier railways are not included in these statistics.

Commuter railways are required to report any incident that occurs on railway property and causes a derailment, equipment damage, property damage or injury to employees or the public. There were 129 reported incidents in 2007. Incident investigation by safety officers determined that none of the incidents were caused by inadequate rail operational policies and procedures, passenger handling procedures or equipment failures. The majority of these incidents were slips, falls and trips on commuter rail property (including station entrances and platforms) that caused minor injuries.

Industrial railways reported 17 incidents. These incidents were slow speed derailments caused by equipment or procedural problems; however, these incidents did not cause equipment damage and did not have any adverse environmental impact. There were no injuries reported.



FUTURE OUTLOOK

In 2007, the province determined that the definition of recreational railways regulated under the *Safety Standards Act* was too generic and identified a number of railway operations that would be more appropriately regulated under the *Railway Act*. This new class of railways, the "heritage railways", are railways that operate or move rolling stock of historical significance. The Royal Hudson (operated by the West Coast Railway Association) and the Kettle Valley Steam Railway are examples of this type of railway. A total of 11 railways have been reclassified from recreational railways to heritage railways. This change took effect January 1, 2008. The Railway Safety Program has developed a comprehensive set of regulatory requirements for this type of railway operation.

RAILWAY CLASS	TOTAL NUMBER OF INCIDENTS	INCIDENTS PER UNIT
Common Carrier	DATA NOT AVAILABLE FROM TRANSPORTATION SAFETY BOARD OF CANADA	
Industrial	17	11.35 per 100,000 Cars Handled*

* TOTAL CARS HANDLED: 149,831

IMPROVING PUBLIC SAFETY

In the fall of 2007, the Railway Safety Program conducted an education and outreach program. Safety officers held town hall meetings for operators of all classes of railways in 4 cities throughout the province: Nanaimo, New Westminster, Prince George and Nelson. Sixty-one people attended the meetings, which included presentations about accident and incident reporting and the preparation of Safety Management System documentation.

As well, the Railway Safety Program, in partnership with regulators in Alberta, Saskatchewan and Manitoba, developed a guide to railway legislation and regulation as well as rules and standards for industrial and heritage railways. The resulting document, the "railway canons", addresses the regulatory requirements applicable to all classes of railways under provincial jurisdiction.

The Railway Safety Program is currently in the process of developing regulatory requirements for commuter railways in consultation with designers, builders and operators. These requirements are based on the requirements of other recognized national and international regulatory authorities, but will be flexible enough to accommodate advances in technology.

APPENDIX

MUNICIPALITIES THAT ADMINISTER THE ELECTRICAL SAFETY REGULATIONS

The BC Safety Authority oversees electrical safety throughout British Columbia, with the exception of the following municipalities:

- City of Burnaby
- City of North Vancouver
- City of Surrey
- City of Vancouver
- City of Victoria
- Corporation of the District of Maple Ridge
- District of North Vancouver
- Municipality of West Vancouver

MUNICIPALITIES THAT ADMINISTER THE GAS SAFETY REGULATIONS

The BC Safety Authority oversees gas safety throughout British Columbia, with the exception of the following municipalities:

- City of Burnaby
- City of Kelowna
- City of North Vancouver
- City of Richmond
- City of Vancouver
- Corporation of the District of Maple Ridge
- District of North Vancouver

Note: Municipalities administer gas inspection programs for detached dwellings with gas services at a pressure of 14.0 kPa gauge or less as well as other buildings with gas services at a pressure of 14.0 kPa gauge or less and with a total connected load for the meter of 120 kW or less.

DEFINITIONS

CONSULTATION DEFINITIONS

Technology Committee: Non-decision-making bodies comprised of volunteer industry representatives that have a primary role of identifying and advising the BC Safety Authority on public safety issues pertinent to the Authority's mandate.

DOCUMENTS AND PUBLICATIONS

Directives: A document that clarifies interpretations of code or regulation requirements; provides direction concerning how a regulation will be applied; or serves as the instrument by which a Provincial Safety Manager exercises a power granted under the Safety Standards Act.

Information Bulletins: Non-statutory and non-binding instruments that provide general information to employees, stakeholders and the public.

Safety Management System: A formal framework that systematically sets out a company's rules, procedures and responsibilities with regards to safety.

Safety Orders: Binding instruments issued by Provincial Safety Managers to prevent, avoid or reduce the risk of personal injury or damage to property.

Equivalent Standards Agreement: An objective-based contract made between the BC Safety Authority and a regulated company. Under this Agreement, the emphasis for safety is placed on what needs to be achieved, not how it is to be achieved.

INCIDENT DEFINITIONS

Confirmed Incident: An incident that has established causal involvement by regulated equipment.

Disqualified as an Incident: Reported cases that do not meet the minimum requirements of an incident (as defined by the BC Safety Authority).

Household Incident: An incident that has occurred in a residential setting or premises.

Incident: An event that involves technology overseen by the BC Safety Authority and either:

- (a) causes death, personal injury or damage to property, or
- (b) creates a risk of personal injury or damage to property.

Incident Notification: A suspected incident that has been registered with the BC Safety Authority. Following investigation, all reported cases are evaluated against the definition of an incident and are further classified as either an actual "incident" or "disqualified as an incident".

Non-Household Incident: An incident that has occurred in a non-residential setting or premises. This includes commercial, industrial, construction, institutional and recreational premises.

INCIDENT CAUSES

People: An incident primarily caused by or involving human-related factors. These human factors include lack of attention, a rule violation, lack of knowledge and sabotage.

Equipment: An incident primarily caused by or involving regulated machinery or products. Equipment-related incidents are caused by either a product failure, design flaw or manufacturing flaw.

Leadership or Procedures: An incident primarily caused by or involving a failure to manage and adhere to established safety guidelines, processes and standards. This includes causes such as inadequate staff training, lack of staff, lack of maintenance, incorrect procedures, poor quality control and misuse of equipment.

Environment: An incident primarily caused by or involving climate, weather or naturally occurring conditions. Examples include incidents caused by wind, lightning, earthquakes, hail, snow and mud or rock slides.

Undetermined: An incident where the primary cause cannot be assessed or confirmed. Undetermined incidents are normally the result of insufficient evidence remaining from a fire and as such it is not possible to either confirm or deny that regulated equipment caused the incident.

Unspecified: An incident where the cause was not identified when reported to the BC Safety Authority. These incidents are normally investigated by another organization and later reported to the BC Safety Authority.

INJURY CLASSIFICATION

Permanent Injury: An injury that involves long-term impairment of function or loss of function of any body part, organ or mental faculty.

Major Non-Permanent Injury: An injury that involves significant physical pain and some disability or loss of function; this includes fractures, internal injuries or wounds that are serious but not life threatening and psychological trauma that results in some temporary or partial disability. Further professional medical attention is required.

Minor Non-Permanent Injury: An injury that may require some medical treatment; this includes lacerations, contusions, abrasions or any other injuries that have no residual effect. Further professional medical attention is not required.

Near-Miss: An incident where no actual harm resulted, but the contributory causes are serious, and under different circumstances may have led to serious injury or death.

Serious Injury: An injury that requires medical attention including, but not limited to: fractures, burns, internal injuries and considerable exposure to toxic substances. The injury may involve impairment or loss of function of any body part, organ or mental faculty. Both Permanent Injury and Major Non-Permanent Injury fall under this category.

INSPECTION DEFINITIONS

Assessment: An evaluation or review that may include inspection or audit.

Certificate of Inspection: A report completed by a safety officer to document the inspection of regulated work and/or product.

Inspection: A physical examination of work and products to see if they meet safety requirements.

Non-Compliance: A failure to comply with a required code or safety regulation.

Risk-Based: A process using the product of probability and consequence to evaluate a number of factors to determine the potential hazard.

BCSA EXECUTIVE

Harry Diemer
President & Chief Executive Officer

Vicky Barr-Humphries
Vice President Education,
Communication & Outreach

Trevor Fedyna
Vice President Corporate Services
& Chief Financial Officer

Shelley Milne
Corporate Secretary & General Counsel

Catherine Roome, PEng
Chief Operating Officer

Diane Sullivan
Vice President Human Resources

BCSA BOARD OF DIRECTORS

John Watson PEng, Chair

Dorothy Beckett CRSP

Peter Cook BA, MA

Tom Fletcher BES, MA, MCIP

Axel Gringmuth GTE

Robert Lashin PEng

Peter Meekison OC, PhD

George Morfitt FCA

Lorna Pawluk LLB

Lorne Seitz

Martha Warren BA, LLB (Hons), LLM

Ray Whitehead

BCSA SAFETY MANAGERS

Ed Ferrero, Acting Manager
Boilers, Pressure Vessels & Refrigeration
Ed.Ferrero@safetyauthority.ca

Stephen Hinde, PEng
Electrical
Stephen.Hinde@safetyauthority.ca

Janice Lee, PEng
Elevating Devices
Janice.Lee@safetyauthority.ca

Wayne Lock
Gas
Wayne.Lock@safetyauthority.ca

Greg Paddon
Passenger Ropeways & Amusement Rides
Greg.Paddon@safetyauthority.ca

Eric Samuelson
Railways
Eric.Samuelson@safetyauthority.ca

BCSA STATE OF SAFETY PRODUCTION TEAM

Design + Production: Hangar 18 Creative Group Inc.

Photography: Craig Hodge
Hoga
Point Blank Photography
Swanky Photographic

Copywriting: Ed Hurd, PEng
Stephanie Salido

Copy Editing: Inscript Inc.

Production: Amanda Rodham

Project Management: Ed Hurd, PEng



Suite 400-88 6th Street
New Westminster BC
V3L 5B3
604 660 6286

1 866 566 7233 [SAFE]

www.safetyauthority.ca

info@safetyauthority.ca



At the British Columbia Safety Authority, we have made a commitment to use sustainable and environmentally conscious printing practices. This document uses Astrolite paper containing 100% post-consumer waste that is processed without the use of chlorine or chlorine compounds. By doing this we have reduced air and water pollution, energy use and chemical waste.

